FCC§15.247 (i), §1.1310 &§2.1091 –RF EXPOSURE

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1310, 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm2)**	**Averaging Time (minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density

Calculated Formulary:

Predication of MPE limit at a given distance

S = PG/4 π R² = power density (in appropriate units, e.g. mW/cm2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Measurement Result

Mode	Frequency Range (MHz)	Antenna Gain		Target Output Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2412~2462	0.50	1.12	14.50	28.18	20	0.0063	1.0
802.11g		0.50	1.12	12.00	15.85	20	0.0035	1.0
802.11 n-HT20		0.50	1.12	12.00	15.85	20	0.0035	1.0
802.11 n-HT40	2422~2452	0.50	1.12	12.00	15.85	20	0.0035	1.0
BLE	2402~2480	0.20	1.05	5.00	3.16	20	0.0007	1.0
LTE Band 2	1850~1910	0.50	1.12	24.00	251.19	20	0.0561	1.23
LTE Band 4	1710~1755	0.50	1.12	24.00	251.19	20	0.0561	1.14
LTE Band 12	699~716	-0.30	0.93	24.45	278.61	20	0.0517	0.47
LTE Band 13	777~787	0.00	1.00	24.00	251.19	20	0.0500	0.52

Note:
1). The target output power was declared by the manufacturer.
2) The LTE module FCC ID: RI7ME910C1NA.
3) WiFi ,BLE and LTE can transmit simultaneously; the worst condition was as below:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$ =0.0063/1.00+0.0007/1.00+0.0517/0.47=0.0063+0.0007+0.11=0.1170< 1.0

Result: The device meet FCC MPE at 20 cm distance.